An IoT System for Innovative Cultural Experience

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Abstract

In an increasingly interconnected world, cultural exchange and understanding have gained paramount importance. This study presents a novel and innovative product designed to enhance cultural experiences through a fusion of advanced technology and immersive engagement. Leveraging cutting-edge augmented reality (AR) and Internet-of-Things (IoT) technologies, the proposed product aims to offers an unparalleled opportunity for individuals to engage with and understand cultures in an immersive and interactive manner. The paper elucidates the development, features, and applications of this pioneering product, emphasizing its ability to revolution traditional education, tourism, and cultural preservation efforts. By fusing technological innovation with cultural exploration, the product promises to redefine how people perceive, appreciate, and connect with the world's diverse cultural tapestry.

1 Introduction

Intangible Cultural Heritage consists of intangible features of a culture, which are often preserved through cultural and religious customs, and are reflected in practices, representations, knowledge, and techniques. Some of the intangible traditions are preserved thanks to the oral transmission and collective memory, but also to their material cultural references. Due to the peculiarity of the intangible cultural heritage, its preservation and recording contribute to the beneficial updating and promotion of modern culture internationally. This proposal strengthens the effort made by organizations such as UNESCO, the UN, the Mediterranean Forum, to save and highlight the innovative interaction between monuments and the intangible narratives about them. The region of Eastern Macedonia and Thrace is of particular interest due to the long and rich coexistence of three cultural and religious traditions, Christianity, Islam, and Judaism.

Due to the importance of cultural heritage, more and more products are appearing on the market in order to support actions related to the Museums of the future. Despite the intense interest, the tour applications usually have prefabricated and static content, the same for all categories of visitors. Contrary to common practice, ICE seeks to design and implement an innovative system for the

promotion of cultural heritage. More specifically, in the framework of the ICE project, it is proposed: (i) the creation of an innovative product called ICE (Innovative Cultural Experience) for the active and experiential tour, as well as for the promotion of the cultural or commercial product, and (ii) the development of a content aggregator mechanism for the enrichment of the Augmented Reality material for the highlighted cultural or commercial exhibit. The final ICE product will be addressed to exhibition, educational and other spaces, with the possibility of providing a comprehensive exhibit presentation service, with dynamic content that will be adapted to the preferences, needs and profile of users, through a knowledge management system.

2 Architecture of the Proposed System

The approach of the project is guided by the technology and all the partners that will contribute to the development of the innovative system that is proposed. The ICE system is an advanced implementation (beyond the state of the art) of the Transparent multi-touch Window, in which each exhibit that will be entered, will be able to display to the user / visitor additional information through Augmented Reality in the form of video (simple or 360) and audio (admin enabled).

ICE's innovation includes functional extensions that are not available in the originally mentioned Transparent multi-touch Window technology. More specifically, its innovation is based on the fact of the cognitive background of technology (can be used in a variety of knowledge areas, education, culture, tourism, commercial applications), 360 video viewing (pre-stored or dynamically generated by the user), providing API for connection with external applications-platforms, the use of sensors (e.g., motion), to include meta-information in the descriptions of the exhibits utilizing Internet of Things technologies.

Figure 1: The ICE platform for the presentation of exhibits with Transparent multi-touch Window technology.

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